

Seismic Upgrading – Meeting the Economic Challenge

P.Brent Nahkies BCom VPM(Linc) MAgLERE (Texas A&M)
Lecturer in Property
Lincoln University

Key Words

Seismic Upgrading, Heritage Buildings, Building Act 2004, earthquake prone buildings – inner city revitalisation, incentives.

Abstract

The Building Act 2004 now requires Territorial Authorities (TAs) to have in place a policy setting out how they intend making existing buildings that would be unable to withstand a moderate earthquake safe for their occupiers. Many of the resultant policies developed by TAs have put in place mandatory upgrade requirements that will force owners to expend large amounts of capital on seismic upgrading of their buildings. The challenge for the property owners and TAs alike is to make such development work economic or the result will be wide scale demolition of old buildings. This has serious implications for both heritage conservation and inner city revitalisation plans that are based on existing heritage buildings. This paper sets out the issues and challenges for the seismic upgrading of buildings in New Zealand and puts forward some potential solutions.

1.0 Introduction

Early buildings in New Zealand were characterised by the use of timber which was both plentiful and cheap. Problems with fire however encouraged the use of unreinforced masonry in towns and cities with little thought given to the perils of earthquakes prior to the disastrous Napier earthquake of 1931. This resulted in the introduction of the first earthquake design standards in 1935. Significant design changes were also introduced in 1965 and 1976 with additional refinements in 1984, 1992 and 2005. These design changes recognised the growing body of knowledge about earthquakes and changes in construction methods. The issue of designing buildings to survive earthquakes is not unique to New Zealand but one shared with many other countries including those located on the “pacific rim of fire” such as Japan and the east coast of the USA.

Although the issue of designing new buildings to survive earthquakes has been addressed by improved design standards the issue of dealing with old buildings that were not designed to withstand earthquakes has long been a problem for Territorial Authorities (TAs) in New Zealand. Under section 301 of the Municipal Corporations Act 1968 and then section 624 of the Local Government Act 1974 TAs were given wide ranging powers that enabled them to have the buildings made safe. These powers were continued in section 66 of the Building Act 1991 and remain in section 124 of the Building Act 2004. However, the extent to which these powers have been used has varied widely between different local authorities. A few TAs such as Wellington have used their powers in an active way by the serving of notices on owners requiring them to take action to make their buildings ‘safe’. In order to do this the owners

must strengthen, demolish or ‘mothball’ their buildings. Most TAs in New Zealand took a passive approach to using their powers and did not serve many section 66 notices on buildings. This was evident in a 1997 survey of TAs by the Building Industry Authority (BIA) which showed that only 5 out of the 64 responding Councils had actually issued notices under section 66 of the Building Act (New Zealand Society for Earthquake Engineering, 1998).

In response to concerns raised by the earthquake risk buildings study group of the New Zealand Society of Earthquake Engineers (NZSEE), the Building Industry Authority began preliminary public consultation on Section 66 of the Building Act in 1997. Consultation included a number of public forums in the major cities after which the BIA produced a discussion paper in February 1998 called “Keeping Buildings Safe and Sanitary”. This paper contained a number of suggested changes to the Building Act in relation to earthquake prone buildings. The process was then effectively put on hold however, as it became apparent that due to the leaky homes crisis the entire Building Act needed to be revised and not just section 66. This review process was lengthy but it eventually culminated in the passing of the new Building Act which came into force on the 30 November 2004. The new Act is over 400 pages long and has approximately 450 sections. It is thus a comprehensive piece of building regulation legislation. However most of the changes introduced by the new Act have limited specific impacts on the existing building stock. This paper focuses on those changes to the Building Act that are relevant to the owners and developers of old buildings. The most significant changes are those relating to “earthquake prone” buildings which have incorporated many of the changes to Section 66 that were proposed back in 1998.

One of the major changes which has occurred is in relation to the definition of what constitutes an “earthquake-prone” building. This is now defined in section 122 of the new Act as follows:

Section 122 Meaning of earthquake-prone building

(1) A building is earthquake prone for the purposes of this Act if, having regard to its condition and to the ground on which it is built, and because of its construction, the building-

(a) will have its ultimate capacity exceeded in a moderate earthquake (as defined in the regulations); and

(b) would be likely to collapse causing-

(i) injury or death to persons in the building or to persons on any other property; or

(ii) damage to any other property.

(2) Subsection (1) does not apply to a building that is used wholly or mainly for residential purposes unless the building-

(a) comprises 2 or more storeys; and

(b) contains 3 or more household units.

The new definition set out in section 122 of the 2004 Act contains a number of significant changes compared with 1991 Act. Under the 1991 Act only unreinforced masonry buildings were defined as earthquake-prone whereas the 2004 Act includes other buildings such as non masonry or concrete buildings.

The old definition was based on compliance with the 1965 Chapter 8 Building Code to a level of 50% of this code. This equates to structural strengths of approximately 10% of the current code.

Note that the new definition of an earthquake-prone building now explicitly takes into account ground conditions as well as the structure of the building itself. It is also linked to a further definition of what constitutes a moderate earthquake which is contained in the regulations. This gives the potential to effectively change the definition of what constitutes an earthquake prone building at the discretion of the Building and Housing Department without having to change the Act itself.

The current trigger level or minimum standard under the 2004 Act is equivalent to one third that of a new building. This is specified in section 7 of the Building (Specified Systems, Change the Use, and Earthquake-prone Buildings) Regulations 2005 where a “moderate earthquake” is defined as:

...in relation to a building, an earthquake that would generate shaking at the site of the building that is of the same duration as, but that is one-third as strong, as the earthquake shaking (determined by normal measures of acceleration, velocity, and displacement) that would be used to design a new building for that site.

This means that far more buildings are now subject to Section 122 of the new Act than were caught by Section 66 of the old Act as the new ‘trigger’ level will have the effect of reclassifying some buildings that previously were not considered to be earthquake risks to become classified as dangerous.

Having identified a building as either insanitary, dangerous or earthquake prone the TA has wide ranging powers under Section 124 to take action as follows:

Section 124 Powers of territorial authorities in respect of dangerous, earthquake-prone, or insanitary buildings

(1) If a territorial authority is satisfied that a building is dangerous, earthquake prone, or insanitary, the territorial authority may –

(a) put up a hoarding or fence to prevent people from approaching the building nearer than is safe:

(b) attach in a prominent place on, or adjacent to, the building a notice that warns people not to approach the building:

(c) gives written notice requiring work to be carried out on the building, within a time stated in the notice (which must not be less than 10 days after the notice is given under section 125), to –

- (i) *reduce or remove the danger: or*
 - (ii) *prevent the building from remaining insanitary.*
- (2) *This section does not limit the powers of a territorial authority under this Part.*
- (3) *A person commits an offence if the person fails to comply with a notice given under subsection (1) (c).*
- (4) *A person who commits an offence under this section is liable to a fine not exceeding \$200,000.*

The powers conferred on TAs under section 124 in relation to earthquake prone buildings are nothing new and are similar to the powers under the 1991 Act and before that to those under section 624 of the Local Government Act. As discussed earlier what is new is the ‘threshold’ level contained in the regulations.

Another significant change in the Act is the requirement for TAs to prepare and adopt a policy that explicitly addresses the problem of earthquake prone buildings (and unsafe and insanitary buildings). Under existing legislation the response of TAs to this problem has generally been limited with Wellington City being one notable exception. The 1991 Act left it up to the individual TAs to decide to what extent they proactively enforced section 66. Most chose not to enforce section 66 but the new requirements imposed by sections 131 and 132 as detailed below makes this option less politically tenable.

Section 131 Territorial local authorities must adopt policy on dangerous, earthquake-prone, and insanitary buildings.

- (1) *A territorial authority must, within 18 months after the commencement of this section, adopt a policy on dangerous, earthquake-prone, and insanitary buildings within its district.*
- (2) *The policy must state-*
 - (a) *the approach that the territorial authority will take in performing its functions under this Part; and*
 - (b) *the territorial authority’s priorities in performing those functions; and*
 - (c) *how the policy will apply to heritage buildings*

Section 132 Adoption and review of policy

- (1) *A policy under section 131 must be adopted in accordance with the special consultative procedure in section 83 of the Local Government Act 2002.*
- (2) *A policy may be amended or replaced only in accordance with the special consultative procedure, and this section applies to that amendment or replacement.*

- (3) *A territorial authority must, as soon as practicable after adopting or amending a policy, provide a copy of the policy to the chief executive.*
- (4) *A territorial authority must complete a review of a policy within 5 years after the policy is adopted and then at intervals of not more than 5 years.*
- (5) *A policy does not cease to have effect because it is due for review or being reviewed.*

In response to section 131 each TA had to develop a suitable policy by 31 May 2006. Note that under section 131 the TA is only required to adopt a policy and there are still no legislative directives as to the form that this policy must take. It would therefore be possible that a TA could adopt a policy that did nothing in terms of regulating earthquake prone buildings. Clearly though the policy is expected to achieve the purpose of the Act – in particular the “health and safety provisions” embodied in Sections 3 which sets out the purpose of the Act. There also appears to be a degree of review by the chief executive of the Department of Building and Housing and it is clearly the intention of the new Act to encourage TAs to take a more proactive role in addressing the problem. The Department of Building and Housing developed a “Policy Template” and some “Policy Guidelines” (Department of Building and Housing, 2005) as an aid to Territorial Authorities (TAs).

The role of the Policy Guidelines document is described as follows:

The document is intended to act as a resource from which can draw in developing their individual policies. It is not prescriptive. It is expected that TAs, in consultation with their communities, will develop policies that strike a balance between the need to address earthquake risk and other priorities, taking account of the social and economic implications of implementing the policy.

The policy guide sets out the two main approaches that can be used by Councils and which are characterised as either “active” or “passive”. These approaches are described in the guidance notes as follows:

1 Approaches to policy implementation

Before a TA submits its draft Earthquake Prone Buildings (EPB) policy for community consultation, it should consider the way in which it wishes to implement its policy. The Department considers that there are two principle approaches that TAs could adopt.

An active approach

Under an active approach, a TA would carry out an initial evaluation of buildings in its district to identify those likely to be at high risk. In the light of this, the TA should establish priorities for further, more detailed evaluations, set timetables for action and set guidelines of required performance levels for upgrading.

A TA would then advise building owners that their buildings are likely to be earthquake-prone and, if appropriate, seek from them a detailed assessment of the building. The policy should address which party will bear the cost of the assessment.

Adoption of this approach will provide a TA with the best possible risk reduction programme as it is able to set and control the level of any work required to mitigate risk.

A passive approach

If a TA were to adopt a more reactive approach, the Initial Evaluation Process (IEP) and detailed assessment and any improvement of structural performance would be triggered by an application under the Building Act for building alteration, change of use, extension of life or subdivision.

With this arrangement, on receipt of an application relating to a building that the desktop research indicated could be earthquake-prone, a TA would undertake an IEP on the building. If this process indicated that the building was likely to be earthquake-prone, the TA would seek a detailed assessment of the building's structural performance before issuing a building consent. If the detailed assessment indicated that a building was earthquake-prone, a TA would issue a notice to reduce or remove the danger to the level set out in its EPB policy. This work could be undertaken as part of the building work for which an owner seeks consent. However, once an application activates the EPB policy, a TA should require any necessary upgrading to be undertaken even if a building owner decides not to undertake the building work set out in the application.

This second approach has the significant disadvantage that it relies on a somewhat haphazard order of remediation based essentially on an owner's intention for a building. This could leave some significant high-risk buildings untouched for a long period of time. On the other hand, the cost of administering such a programme would be significantly less than for an active programme.

Despite saying that the guidelines are not prescriptive the purpose of the legislation is to 'spur' TA's into being more proactive regarding earthquake strengthening and there is a clear bias in the guidelines towards the implementation of an 'active approach'. The results of this encouragement can be seen in a summary of the various policies that has been compiled by The Department of Building and Housing relating to the various earthquake-prone building policies from all 73 TAs. This shows that approximately 45% have adopted an active policy, 32% have adopted a passive policy and the remaining 23% have policies that are both active and passive ((Department of Building and Housing, 2008).

2.0 Economic Impacts

The economic impacts of the implementation of earthquake prone buildings policies are likely to be substantial when measured at both a community level and as they affect individual property owners. In general the effects on the property market and economy will clearly depend on the number of buildings affected. Although the number of earthquake prone buildings in New Zealand has been in decline due to both demolitions and voluntary strengthening, this long term trend will be countered by the change in definition contained in the regulations. This change captures buildings that are currently between approximately 10% (i.e. 50 % of the 1965 Code) and 33.33% of current code and were previously not defined as earthquake prone buildings. It is not clear what that number will be but it will undoubtedly contain some of the early examples of concrete buildings built in the 30's, 40's and 50's. The number of buildings that will be affected will vary from locality to locality but it has been estimated by the department of Building and Housing that up to 10% of buildings

built between 1935 and 1976 could be earthquake prone depending on their location and their structural characteristics. Buildings built after 1976 are unlikely to be earthquake prone but cannot be excluded from possible assessment (Department of Building and Housing, Web Site). Note that virtually all buildings built prior to 1935 are likely to be earthquake prone unless they have been significantly structurally strengthened.

Section 131 policies impose an element of economic obsolescence that has the potential to seriously erode the existing values of some old buildings. Anecdotal evidence would tend to support the view that market awareness regarding the potential liabilities and legal obligations relating to earthquake prone buildings is limited. Therefore the premise behind much of the following discussion is that the property market is far from efficient and that future obligations imposed by the changes in legislation have generally not been anticipated by the market and factored into investment decisions. As a result there is insufficient weighting given to potential earthquake strengthening costs in investment and purchase decisions. Buyers therefore pay too much for their old buildings because their due diligence fails to adequately account for earthquake strengthening requirements. This situation is encouraged by vendors and real estate agents 'playing down' the situation and the confusion or market disinformation regarding the degree to which existing buildings may have been strengthened. The reason for this is due to ignorance in the market about current strengthening levels. Most buildings that have been 'strengthened' in the past have been strengthened to comparatively low levels when compared with the current code. Many tenants or owners have purchased or leased buildings in the belief that they have been "strengthened" or even "fully strengthened to 100% of Code" without fully understanding what this means. They are unaware that the code being referred to is the 1965 Code and that as a result the degree of strengthening is substantially less than that of a comparable new building.

Although it is the contention of this paper that many market players are uninformed regarding earthquake strengthening requirements, this is clearly a generalisation that will not apply to all sub markets. There will be some informed potential purchasers who will factor earthquake strengthening costs into their investment decisions. In most cases they will be out bid by less informed purchasers unless it is their intention to demolition or alternatively they have an economically viable change of use planned for the building. Both of these scenarios render earthquake strengthening requirements under a section 131 policy largely irrelevant. Alternatively some purchasers may have paid a 'high' price because they consider that the liabilities of earthquake strengthening that are to be imposed are so far in the future that they can largely be discounted or that perhaps they may not be effectively enforced. Some purchasers may also assume that some form of local government subsidy or compensation will be available to off set these future costs. Future research to test market awareness of section 131 policies would be highly valuable.

The issue of earthquake strengthening has undoubtedly already got a wider public profile with the introduction of section 131 policies by TAs which required that the special consultative process set out in the Local Government Act was adhered to. This should have already increased market awareness and this education process will continue as policies are implemented.

The need for market education has been identified by the New Zealand Society of Earthquake Engineers (NZSEE) who have been concerned at the apparent lack of market awareness. They advocate that in addition to the regulatory requirements of the Building Act that a non regulatory method of building gradings be introduced by TAs. The purpose of such a grading

system would be to ultimately achieve levels of strengthening greater than those imposed by regulation. The regulations are seen by the NZSEE as a “backstop” while the gradings are designed to “raise awareness in the industry and allow market forces to work. In time, the owners of lowest grade buildings would find themselves under pressure to improve or face loss of revenue”(NZSEE, 2000). Such a public grading system would mean that those dealing with a building (such as owners, purchasers, tenants and workers) could do so with knowledge of its seismic resistance. This may well raise concerns amongst employers of their obligations under the Health and Safety in Employment Act in terms of housing employees in buildings that are of comparatively low strength and hence high risk. Such a grading system may have a dramatic effect on the market for old buildings by leading to a significant reduction in rents and values. The reductions would depend on the extent to which occupiers perceive there to be a real safety risk. If they see the risk as significant then it is possible that some old buildings may become unusable as employers seek to comply with the Health and Safety Act by refusing to house their employees in buildings that are deemed to be not safe. It may also eventually force all TA's to enforce a proactive section 131 policy due to consumer or public demands for safe buildings.

The insurance industry has a greater knowledge regarding the effective levels of earthquake strengthening than most owners and tenants. In their opinion a building that has been strengthened up to Full 1965 Code or even to one third of current code remains essentially an unstrengthened building. Such a building has been strengthened to the point that the lives of its occupants have been safeguarded but the building itself is unlikely to survive a substantial earthquake. Unstrengthened or partly strengthened buildings have had massive increases in the cost of their insurance or in some cases have struggled to obtain insurance at all. This situation is unlikely to improve and both the ability to obtain adequate insurance and the cost of insurance may therefore become important issues for some old buildings. High insurance costs increase the operating expenses of old buildings compared with more modern competitors thus making them less competitive with newer building stock. This reduces their economic viability and has a negative impact on the values of old buildings. It also provides a positive incentive to owners to strengthen their buildings to high levels acceptable to their insurers. Clearly the insurance industry has a role to play both in raising market awareness and in encouraging earthquake strengthening.

Impacts of an Active Approach

The economic impacts of the section 131 policies will vary depending on the approach taken. In theory the impacts of an “active” approach are likely to be more severe than those of a passive approach. An owner forced to comply with an active approach faces the cost of an “Initial Evaluation” although some TA's are paying for this. If identified as a potential earthquake prone building at this initial stage they must then meet the cost of a “Detailed Evaluation” and if this proves the building to be earthquake-prone they must then take action within the time frames set down in the policy. Assuming they choose to strengthen then they must pay for engineering design and construction costs. These costs are likely to come under strong inflationary pressures if there are large numbers of property owners being required to upgrade at the same time.

In addition to these direct costs the owner may need to meet a number of indirect costs. For example there may be borrowing costs related to obtaining money to finance the work. Given the current global credit crunch obtaining finance may be difficult for some owners. Another

significant indirect cost of upgrading is the degree of disruption that it might involve in terms of the occupants of the buildings. Where a building is tenanted then this might be seen as a major problem as the landlord will be trying to avoid disruption to their tenants. There may also be a loss of rental income as tenants are relocated while the work is carried out or in some cases there may be a loss of tenants altogether where the existing lease is short term or due to expire.

In most cases the functional utility of a building is not increased by earthquake strengthening retrofits and in fact may be impaired. For example there may be a loss of useable or rentable floor area, the aesthetic appearances of the building may suffer, and there may be a reduction of natural light.

The challenge for the owner therefore is to capture added value resulting from their expenditure on earthquake strengthening. However, much of the potential upside or potential for added value relies on the market already having discounted unstrengthened buildings thus providing the ability to recapture this lost value. For existing owners who have already paid 'full price' the best that they are likely to achieve is to maintain their existing values. Depending on the lease of the building the landlord may try and recover the costs of the upgrade back from the tenant by way of an "Improvement Rent Percentage" such as is contained in Auckland District Law Society Lease. However, this may cause hardship for the tenant and in addition the tenant is likely to be very resistant to paying increased rents unless their utility is clearly improved in some way.

The potential for added value is possible if the owner can achieve lower operating expenses due to reduced insurance costs, or obtain higher occupancy rates by overcoming market concerns regarding health and safety. In a well informed market the capitalisation rates should be lower for strengthened buildings due to their lower risk as an investment. Making this added value equal the direct and indirect costs of the strengthening is the challenge to the owner. If they are unable to capture sufficient added value from the expenditure on earthquake strengthening then it may not be economically feasible to strengthen the building. Where the reduction in the value of the building is such that the added value of the buildings becomes negligible then such buildings may be demolished, particularly if this allows the site to be used as a car park to provide holding income.

As well as the economic impacts on the individual private property owner there may be specific and significant financial impacts on community groups or organisations that own old buildings and do not have the budgets to undertake upgrading. Falling into this category are churches, schools and charitable organisations. This might lead to a number of negative social impacts if the operation of these organisations is adversely effected by the need to close buildings, sell buildings or upgrade buildings. Central and local government are also going to need to find substantial amounts of capital to strengthen their own buildings which will increase pressure to increase rates and taxes.

Critics of active strengthening policies such as Ian Smith (Smith, 2000) argue that the increased stringency is unnecessary as the benefits of strengthening will and are being achieved by a process of natural attrition and regeneration which forces a need for upgrade due to change of use and alterations. They consider that the social costs are high as most earthquake prone buildings are owned by family trusts and small businesses

Impacts of a Passive Approach

Under a passive approach a requirement to do a seismic upgrade will be triggered by either an application to alter a building or alternatively to carry out a change of use on a building. In theory the implementation of a passive approach should take longer as it will occur as part of the natural aging and regeneration process that occurs over time for building stock. Therefore it is less likely to cause any 'shocks' to the property market. In addition it should be less onerous on the property owner and therefore have less of a negative economic impact. The upgrade requirements triggered by alterations are less extensive and therefore less of an issue than those triggered by a change in use. A change of use requires that a building be upgraded to a structural level that is as near as reasonably practicable to that of a new building. This has been interpreted by most TAs to mean up to a level that is at least two thirds that of current code.

In both instances the decision to alter or change the use is theoretically at the discretion of the owner and thus should be less of a threat than an upgrade forced by a section 124 notice. There is the potential for the owner to minimise their indirect expenses and this is one of the benefits of implementing a passive policy in relation to earthquake prone buildings. In theory it can be done at a time which suits the owner and when it is economically viable. However the fear of triggering a structural upgrade by carrying out alterations can potentially be to reduce the investment in older buildings. This has been the case in cities where the TA has taken a passive approach to earthquake prone buildings. Owners may decide to defer alterations or to leave buildings vacant rather than trigger additional upgrade requirements that do not appear economically feasible. Alternatively owners may indulge in a certain amount of illegal building work or fail to inform the TA of a change of use.

3.0 The Impacts on CBD Revitalisation

Earthquake prone buildings are particularly prevalent in the CBDs of our older cities and towns. Many of these cities and towns are concerned with the need to maintain and revitalize the economic health of their traditional CBD and main street shopping areas. For example, the city of Christchurch has for some time had a strategy to revitalise the inner city which has been in gradual decline for many years. There are strong concerns that Christchurch may become a "donut" city if this decline is not reversed. Central to this aim of revitalisation is the need to retain the character of CBD areas by retaining heritage buildings in order to create a 'sense of place'. This is also an important part of the Urban Design Protocols signed by many TAs and used as a guide to future development. Many regional towns also have main streets areas dominated by old buildings that are currently only marginally economic. For example towns like Timaru, Hastings and Wanganui.

The concern is that the imposition of an onerous policy actively targeting old buildings will create large numbers of economic 'white elephants'. With the current global credit crunch and the decline in property markets it will become particularly challenging to make new developments stack up. It will also be rare for refurbishment and the upgrading of old buildings to be economically feasible. Old buildings will be demolished even though it will be uneconomic to replace them with new development. These demolitions may destroy any character or 'sense of place' that could be used as a building block for future revitalisation. Alternatively those buildings not demolished may become vacant and neglected and thus become a target for vandalism creating a downward spiral in the fortunes of the

CBD/mainstreet localities in which they are located. The creation of 'blighted' areas characterised by vacant sites and vandalised buildings will lead to further erosion of values for individual properties.

Ultimately a reduction in the value of old buildings may also mean that it becomes feasible to convert the property to an alternative use. This is similar to the situation that occurred after the share market collapse when reduced values for commercial buildings made it feasible to convert them to residential use. Although the existing owners of old buildings will suffer from the loss in value it may benefit new owners and developers in terms of creating conversion and refurbishment opportunities. If the supply of redevelopment sites is increased substantially by wide scale demolition of old buildings then this will also negatively impact on the value of sites for redevelopment. Assuming there is still demand for development product within the locality then the feasibility of marginal developments will be improved by cheaper land costs.

However there is a danger that a prolonged economic downturn as predicted by many economic commentators combined with the creation of blighted urban areas could severely retard this regeneration. Many TAs have taken a passive or relaxed approach to identifying and upgrading earthquake prone buildings due to concerns that a proactive approach will impose too great an economic and social cost on communities and lead to the blight discussed above. The retention of key heritage buildings may be one way to prevent the blight becoming terminal and provide a resource to build on once the current economic and property downturn has run its course. However heritage buildings themselves pose some additional challenges.

4.0 Heritage Issues

In terms of heritage buildings the potentially negative impacts of a policy prepared under section 131 can be significant. Inevitably a large proportion of heritage buildings also fall within the category of earthquake prone buildings in under the Building Act. This creates considerable tension between the health and safety objectives of the BA and the heritage retention objectives of the Resource Management Act (RMA).

This tension was recognised by the select committee which had a new clause 131 (2) (c) inserted before the final reading of the Building Act. This clause explicitly requires that the potential impact of any policy in relation to heritage buildings must be addressed. Any policy should aim to avoid or minimise the loss of built heritage. Although the drive to strengthen earthquake prone buildings is based around saving lives it is also compatible with the objective of strengthening heritage buildings so that they are better able to withstand earthquakes. The demolition of a heritage building by an earthquake is equally to be avoided as the demolition of a heritage building by a developer. Therefore, as a general rule the highest level of strengthening possible should be encouraged within the limitations imposed by economic constraints.

The level of strengthening required to comply with the Building Act may be below the level that will actually provide significant protection to the building itself. The occupants themselves may be made safe but the building may still be effectively destroyed. What is appropriate for heritage buildings will be to strengthen to "as near to new as is reasonably practicable" in both an engineering and heritage sense.

In order to do this may require financial support or a subsidy where a clear need is demonstrated for a particular building. Financial assistance may be required where it is proven to be necessary to tip the economic balance in favour of a successful heritage outcome and to avoid demolition. It can also be done by providing certainty to the market place in relation to information, and thus prevent unrealistic or undesirable investment backed expectations. One way of doing this might be to commission feasibility studies or due diligence if necessary or appropriate.

An alternative non-regulatory approach would be to subsidise the costs of earthquake strengthening of heritage buildings as was done in Wellington. This approach could be used to encourage the voluntary strengthening of buildings.

The spending of public money to subsidise the private costs of earthquake strengthening can be justified on the grounds that it is in the public good. With the introduction of the RMA in New Zealand the protection of heritage has received enhanced attention by TAs. This has also been increased by the elevation of heritage protection as a matter of national importance. As a result many heritage buildings are scheduled in District Plans with strong rules to protect them from demolition or unsympathetic alterations. However there is the potential to challenge heritage controls under section 85(3) of the RMA which provides relief to owners who are unable to put their properties to “reasonable use”. There is a lack of case law to clarify what constitutes reasonable use but a building that requires the expenditure of large amounts of capital to earthquake strengthen with limited economic benefit to the owner may well fall into this category.

In terms of strengthening costs it is not just the financial cost of doing the upgrade but also the damage to the heritage fabric of the building which must be considered. This makes it more difficult and potentially more expensive for the owners of heritage buildings to comply with earthquake strengthening requirements. If TAs require strengthening that is not obtrusive or damaging to the heritage fabric of the building then this may increase the costs of the upgrade.

Where TA's have taken a pro active approach in dealing with earthquake prone buildings by serving notices on the owners their actions have often been tempered by the use of financial incentives or subsidies. For example concerns that such a proactive approach was encouraging the demolition of heritage buildings led to Wellington using financial incentives to subsidise earthquake strengthening for heritage buildings.

As well as the option of strengthening or demolition owners may also ‘mothball’ their buildings in order to remove the danger. This however is not usually a viable economic alternative for private building owners. It is therefore a strategy that is unlikely to be used by owners unless it is necessary to ‘buy time’ before commencing a major refurbishment, change of use or redevelopment project. It has also been done in return for financial support provided by TAs.

5.0 Taxation Issues

From a taxation point of view the treatment of earthquake strengthening costs is somewhat contentious. Inland Revenue have taken the position that expenses relating to earthquake

strengthening are capital expenditure that must be depreciated over the life of the building whereas some owners have argued that the expense is akin to deferred maintenance and should be allowed to be claimed as an expense in its entirety. The position of Inland Revenue appears to have changed over time and where once earthquake strengthening costs were allowed as a deduction against revenue this is no longer the case. This change appears to have been brought about by changes in the tax legislation (the repeal of section 108 of the Income Tax Act 1976) and also the increased costs of earthquake strengthening costs brought about by stricter upgrade requirements.

6.0 Conclusions

The implementation of policies prepared under section 131 of the Building Act has the potential to impose significant financial and social costs on individual building owners and communities. By necessity such policies are a risk management strategy that must try and achieve a balance between risk reduction and costs. From a risk management point of view immediate and mandatory strengthening is the ideal answer but this must be balanced against the costs that such a policy would impose. Any policy will therefore be a pragmatic compromise. The success of this compromise will probably be judged in the future with the use of 20:20 hindsight in relation to if and when a severe earthquake occurs near a major urban centre. In general however, a number of general recommendations can be made to help achieve a good compromise.

Lengthen the process to allow for a gradual market adjustment.

If the cost of upgrading can be deferred into the future then in valuation terms it is discounted to a smaller present value and is less onerous on the owner. It also allows flexibility in terms of fitting around existing tenancies and other potential building alterations such as refurbishments or changes of use. Too concentrated a time to comply is likely to add to the cost if construction capacity in terms of labour and materials are stretched. An extended time also allows for opportunities provided by changes in property cycles. Forcing upgrades to occur in a market downturn or recession will lead to difficulties. Balanced against this however the comparative risk of each building may be used as the criteria to enforce different deadlines on building owners and TAs have commonly adopted such a strategy. Clearly the seismic risk of the particular locality clearly needs to be considered.

Providing certainty in the process.

The property market reacts to uncertainty by increasing the risk premium for investment. If investors can accurately assess their liability for upgrading in terms of time frames, levels of strengthening and financial costs then the risk premium relating to earthquake strengthening is reduced. To a certain extent the need for flexibility and certainty are conflicting objectives but a balance should be achieved. For example, once deadlines are imposed they should be enforced, however flexibility to relax the deadlines can also be included as long as these are based on clear guidelines and criteria.

Provide information that allows the market to behave more efficiently.

In this way owners and investors will be able to make sound investment decisions. This will require a balanced and sound communication programme to avoid over reaction while at the same time educating owners as to their responsibilities under the Building Act and the implications of non-compliance. The effectiveness of such an approach will largely depend on the public having access to good information and also how the public perceives or

interprets such information. If they rate the risk factor as low then there may well be little pressure on owners to strengthen. The grading system proposed by the NZSEE would appear an appropriate method of increasing market awareness.

Encourage appropriate strengthening levels.

Legally it would appear that the maximum that can be enforced in terms of a policy developed under section 131 of the Building Act 2004 is that of the threshold level. There are clearly benefits in advocating for higher levels of strengthening in terms of risk reduction and in order to future proof the buildings by accommodating any future change of use. A problem in Wellington has been the need to enforce a second more rigorous strengthening of a building that has undergone a change of use. Ultimately it may be non-regulatory approaches such as using public gradings that will encourage market led demand for higher strengthening levels than that imposed by section 131 policies. Alternatively financial incentives could be used particularly for heritage buildings where high levels of strengthening are desirable.

Introduce appropriate incentives to help retain heritage buildings.

The need to earthquake strengthen will render some buildings uneconomic and lead to their demolition. To prevent this in the case of buildings with high heritage value will require the use of appropriate incentives such as grants, rates relief or tax relief. Tax credits have been a powerful tool used to promote the retention and rehabilitation of heritage buildings in the USA. A similar approach is worthy of consideration in New Zealand. As a minimum, consideration regarding the deductibility of costs as a revenue item rather than a capital item should be investigated.

Consider staged upgrading

One way to meet the economic challenges of earthquake strengthening would be to strengthen the building over a number of stages. In this way risk reduction can be achieved while lowering the economic impacts on the owner. For such a strategy to be effective however would require expert engineering input and a clear schedule of strengthening that would be legally binding. In a similar way where buildings are being strengthened up to one third of current code there should be engineering advice obtained as design such strengthening to be enhanced in a cost efficient way in the future. Research into potential methods of carrying out strengthening in a series of planned and co-ordinated stages should be a priority.

References

The Building Act 1991.

The Building Act 2004.

The Building (Specified Systems, Change of Use, and Earthquake-prone Buildings) Regulations 2005.

The Resource Management Act 1991.

Building Industry Authority, (1997). *Upgrading Existing Buildings Under the Building Act 1991*. Discussion Paper.

Department of Building and Housing, (2004). *Regulations under the Building Act 2004*. Discussion Document October 2004.

Department of Building and Housing, (2005). Earthquake-Prone Building Provisions of the Building Act 2004: Policy Guidance for Territorial Authorities.

Department of Building and Housing, (2008). *Codewords* No.32 October 2008.

Department of Building and Housing Web Site. *Earthquake-prone Buildings – Frequently asked questions for property owners*. <http://www.dbh.govt.nz/faqs-for-property-owners> 7/01/09.

Ian Smith, (2000). *Report on NZNSEE Procedures and BIA Proposed Section 66 Amendments for Wellington City Council* Unpublished Paper October 2000.

New Zealand National Society of Earthquake Engineering, (2000). *An Initial Evaluation Process for the Identifying Buildings Not Safe in Earthquake*. Draft Paper for Comment August 2000.

New Zealand National Society of Earthquake Engineering, (1998). *Background and Implications of the Suggested Earthquake Provisions*. Unpublished Paper March 1998.